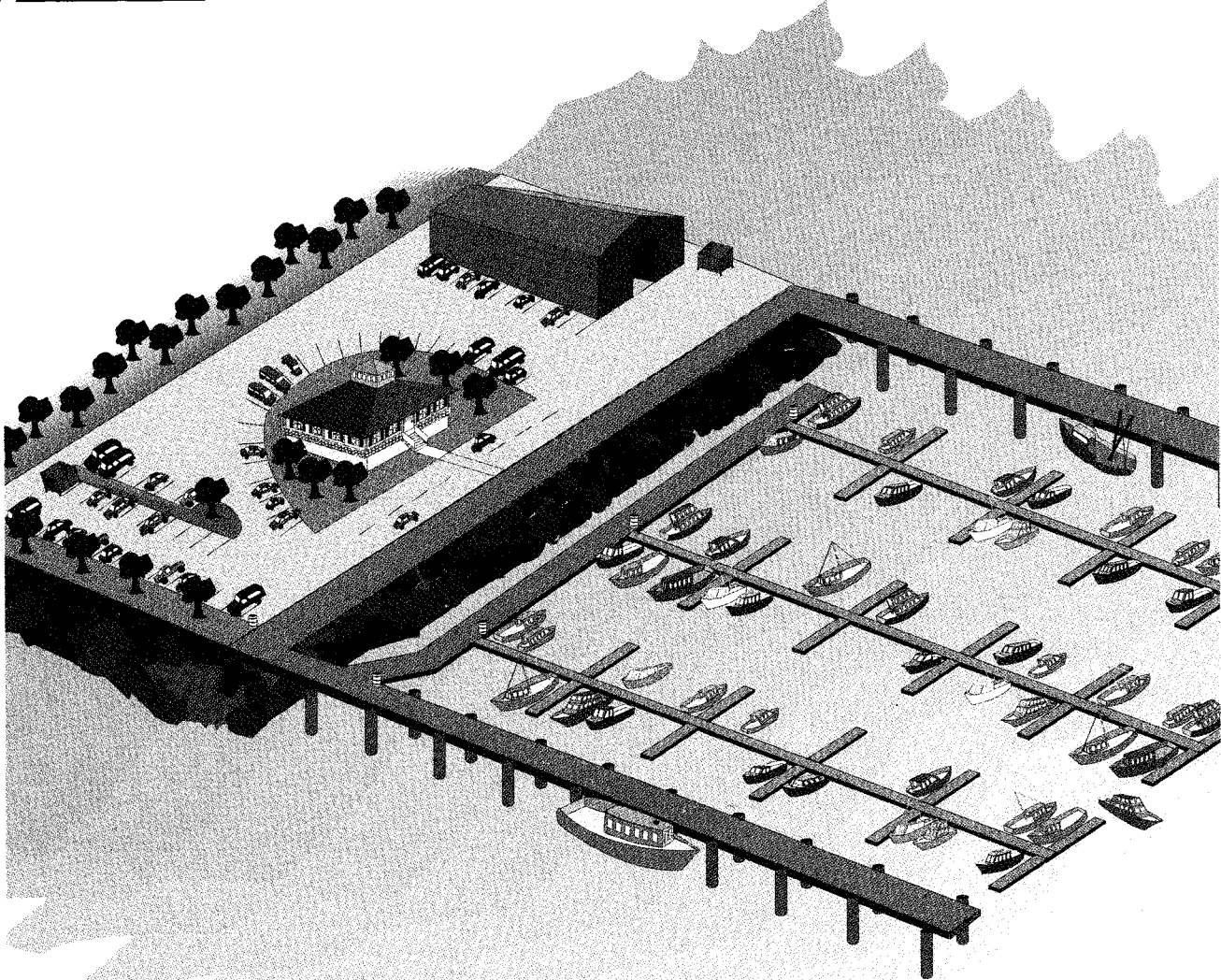




MANAGING WASTE AT RECREATIONAL BOATING FACILITIES



A Guide to the Elimination of Garbage Disposal at Sea

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MANAGING WASTE AT RECREATIONAL BOATING FACILITIES:

**A Guide to the Elimination of
Garbage Disposal at Sea**

**U.S. Coast Guard
Marine Environmental Protection Division
Environmental Coordination Branch
Washington, DC**

April 1994



PREFACE

The guidance provided in this document was extracted by the U.S. Coast Guard from the document *Waste-Handling at Recreational Boating Facilities* prepared for the Water Management Division, U.S. Environmental Protection Agency Region IV under Contract No. 68-C8-0105, Work Assignment No. 3-205, Amendment 2 to U.S. Environmental Protection Agency Office of Wetlands, Oceans, and Wetlands.

The original document was prepared by Battelle Ocean Sciences and the Kearney/Centaur Division, A.T. Kearney, Inc.

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1.0 INTRODUCTION

On December 31, 1988, in response to at-sea garbage disposal limitations that went into effect worldwide, the way mariners handle disposal of vessel-generated garbage changed. On that date, Annex V of the International Convention for the Prevention of Pollution from Ships, 1973 (**MARine POLLution 73/78**) was entered into force. Formally, MARPOL Annex V is entitled, "Regulations for the Prevention of Pollution by Garbage from Ships." Simply, MARPOL Annex V prohibits at-sea disposal of plastic materials and specifies the distance from shore that all other materials may be dumped. It also requires reception facilities for garbage at ports and terminals, which includes recreational boating facilities (i.e., marinas).

MARPOL 73/78 is a convention of the International Maritime Organization, a specialized agency of the United Nations. It is designed to address the problem of marine pollution from vessels on a global scale through five annexes, each of which focuses on a particular type of marine pollution. Under the terms of MARPOL 73/78, signatory nations agree to implement

Annexes I and II, which address pollution from oil and bulk liquid substances, respectively. These annexes are in force internationally. Annexes III, IV, and V, however, are optional and need not be accepted by parties to the convention at the time when they ratify MARPOL 73/78. Annex III applies to packaged hazardous materials, Annex IV deals with sewage, and Annex V deals with disposal of garbage from vessels. Each optional annex goes into effect 1 year from the date of its ratification by at least 15 nations, representing 50% of the world's shipping tonnage. For MARPOL Annex V, this was December 31, 1988.

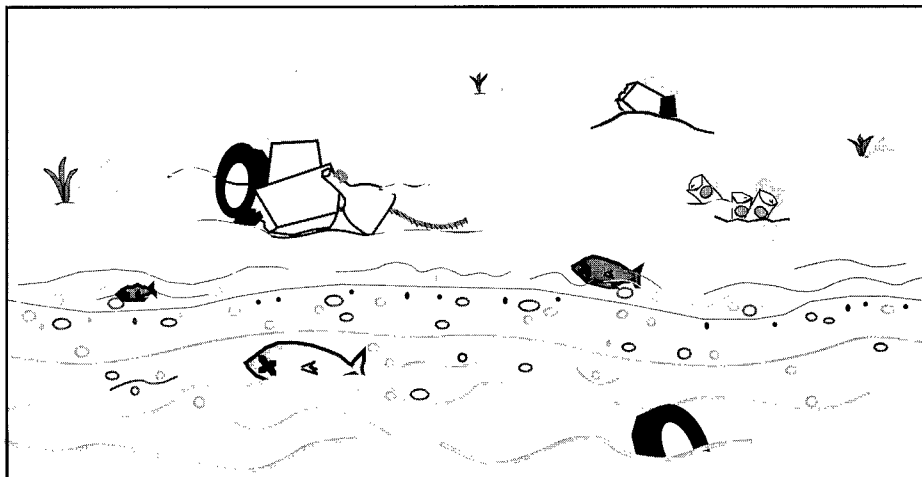
Increasingly, adequate port reception facilities for garbage are being cited as a key in the successful implementation of MARPOL Annex V, with inadequate reception facilities for garbage being cited as an impediment to compliance. This guidance focuses on reception facilities for garbage at recreational boating facilities and how these facilities contribute to the solution of the problem of persistent plastics in the marine environment.

THE PROBLEM

Mariners have traditionally disposed of garbage at-sea. It is a convenient and inexpensive way to dispose of garbage. Until relatively recently, garbage disposed of at-sea was food stuffs, glass, metal, paper, wood, or rope, all of which disintegrate or otherwise disappear into the marine environment. Increasingly, plastics have replaced some of these materials and have become incorporated into every industrial and commercial sector. The qualities that make plastics successful—lightweight, durable, strong, sometimes colorful—make plastics potentially hazardous in the marine environment.

They make plastics a different kind of trash.

Persistent plastics in the ocean are a hazard for marine wildlife, pose a threat to human health and safety, and can be costly to coastal communities. Plastic



debris has entangled marine mammals, fish, turtles, crustaceans, and seabirds, resulting in death by drowning, loss of limbs, starvation, and increased susceptibility to predation. Some marine wildlife, such as fish, whales, porpoises, turtles, and seabirds, mistake plastic debris for food. Ingestion of plastic can result in death through suffocation, intestinal blockage, ulceration, toxic accumulation, and starvation. Plastic debris poses a threat to human health and safety as a navigational hazard and through entanglement of divers and propellers. Plastic debris also washes up on shore as beach litter, where it is unattractive and costly to clean up.

All marine user groups — commercial shipping, commercial fishermen, recreational boaters, recreational fishermen, military vessels, offshore platforms, cruise vessels, research vessels — have been identified as contributors to the problem of plastics in the marine environment. Land-based sources, such as plastics manufacturing and processing activities, sewage and wastewater treatment and disposal systems, solid-waste disposal sites, degraded docks and marinas, and deliberate or accidental dumping by the general public, also contribute to the plastic debris problem.

A STEP TOWARD THE SOLUTION

In recognition of these problems worldwide, disposal of vessel-generated garbage is the focus of MARPOL Annex V. In the United States, the Senate gave its consent to U.S. ratification of MARPOL Annex V in November 1987. The implementing legislation for MARPOL Annex V in the United States is the Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987, Title II of Pub.L. 100-220. The United States Coast Guard (USCG) has the responsibility for developing, implementing, and enforcing regulations on the pollution prevention requirements of MARPOL Annex V.

MARPOL Annex V applies to vessels and ports of signatory nations and vessels in the waters of signatory nations. For the United States, this means that it applies to all vessels (from the largest supertanker to the smallest recreational boat) operating in all navigable waters of the United States (including rivers, lakes, bays, sounds, and the Intracoastal Waterway) and the 200-mile exclusive economic zone, and to vessels over which the United States has jurisdiction everywhere that they operate (except certain government-owned or -operated vessels). It also applies to ports and terminals serving all marine user groups.

MARPOL Annex V provisions apply to five types of garbage: plastics; floating dunnage, lining and packing materials; food wastes; all other garbage; and mixed garbage types. Garbage generally means all kinds of food, domestic, and operational waste (excluding fresh fish) generated during normal operation of a vessel and likely to be disposed of continuously or periodically. MARPOL Annex V prohibits at-sea disposal of plastics and restricts at-sea disposal of other types of garbage, depending on the distance from shore (see Figure 1).

MARPOL Annex V requires the provision of reception facilities for garbage at ports and terminals. These facilities are the temporary link between vessel and land waste-disposal systems. Under U.S. regulations, ports and terminals must be capable of receiving garbage from vessels that normally do business with the port or terminal (33 CFR 158). The term *terminal* as it applies to MARPOL Annex V includes recreational boating facilities that can provide wharfage or other services to 10 or more recreational vessels at the same time (USCG, 1989).

CERTIFICATE OF ADEQUACY FOR GARBAGE RECEPTION FACILITIES

To certify that a port or terminal meets the requirements for garbage reception facilities, the USCG issues a document, called a Certificate of Adequacy (COA). A COA for garbage is required if a port or terminal receives

- Oceangoing tankers or vessels of 400 gross tons or more
- Fishing vessels that offload more than 500,000 lb of commercial fishing product during a calendar year.

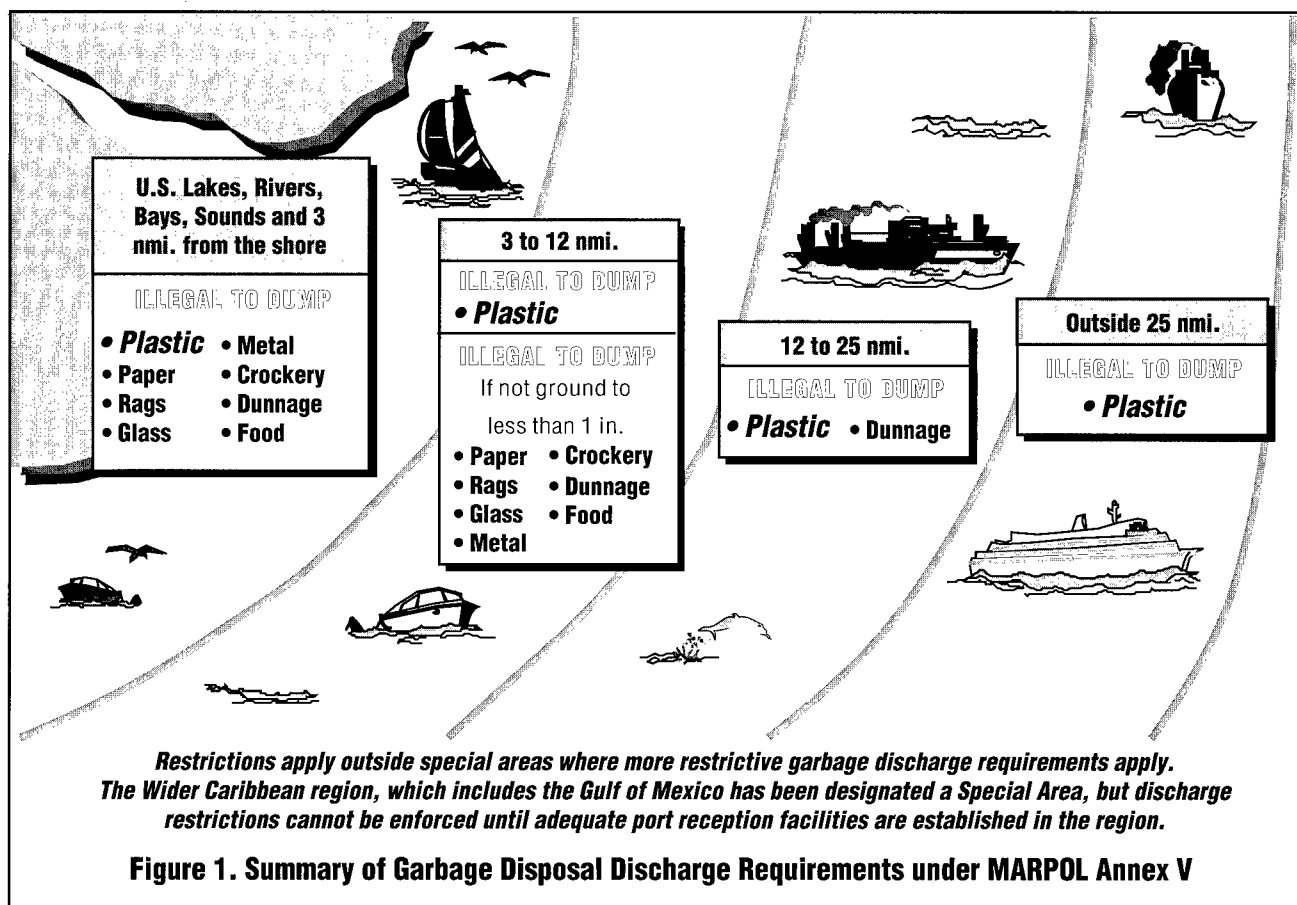
On the COA application, the port or terminal self-certifies that garbage received from foreign ports can be handled within 24 h of notification of the need for the service and that all garbage that the master of the vessel wishes to discharge can be received (except for large quantities of spoiled or damaged cargo or garbage from ships not having commercial transactions with the port or terminal).

If a port or terminal, which comes under the COA requirement, does not have adequate reception facilities the USCG may deny vessels from entering that port or terminal.

PORTS AND TERMINALS NOT REQUIRED TO FILE A COA

Ports and terminals not required to file a COA must still meet requirements for garbage reception facilities. Vessels may be denied entry to ports and terminals not

having adequate reception facilities, whether or not they are required to have a COA. This includes recreational boating facilities.



Managing Waste at Recreational Boating Facilities

The focus of the remainder of this document is waste-handling facilities at recreational boating facilities. Unlike commercial shipping ports and terminals and many commercial fishing facilities, there is no Coast Guard program to ensure adequate reception facilities for garbage at recreational boating facilities.

The techniques to provide adequate reception facilities for garbage at recreational boating facilities are not specified by USCG regulations. Yet, recreational boating facilities have a significant role to play in the successful implementation of MARPOL Annex V.

2.0 CHARACTERIZATION OF WASTE-HANDLING AT RECREATIONAL BOATING FACILITIES

This Section characterizes the reception facilities and waste-handling practices and impediments to compliance with MARPOL Annex V, at recreational boating facilities. A list of references is included at the end of this document. Waste-handling at recreational boating facilities is characterized in terms of

- administrative arrangements
- waste-stream characterization
- equipment and service alternatives
- equipment spatial requirements and siting
- recycling
- financing and cost recovery
- coordination of facility and boater requirements
- handling facilities for vessel maintenance wastes
- MARPOL Annex V awareness, and
- Other issues relating to solid-waste management issues.

ADMINISTRATIVE ARRANGEMENTS

The typical administrative management structure for waste-handling present at recreational boating facilities lie in the following four categories.

- Owner/operator (financial decision maker) in charge of daily operations with all employees participating in waste-handling
- Administrative manager, with financial decision-making authority, in charge of daily operations; dedicated staff responsible for waste-handling
- Administrative manager without financial decision-making authority (i.e., overseeing operations for acting, absentee owner/operator) in charge of daily operations; dedicated staff responsible for waste-handling
- Dockmaster/harbor master/manager, where the facility is part of a larger complex, involved in daily operations; acting for owner/operator.

The following is a description of how the waste-handling strategies at recreational boating facilities differ by the type of administrative arrangements present.

Owner/Operator Involvement. This administrative arrangement is found most often among the "mom and pop" type of operation as well as at some larger facilities where the owner takes an active role in the management of the facility.

Owners/operators of facilities are more apt to be aware of the effect (in the form of good public relations) that a clean appearance has on their business and they understand that clean surroundings affect their profit. As a result, the more involved the financial decision maker is in daily operations of the facility, the more emphasis was found to be placed on waste-handling issues and environmental concerns. These owners/operators place a high level of importance on providing a clean facility for the facility users, including adequate waste-disposal receptacles, favorable esthetic appearance of waste-disposal receptacles, and clean water in the facility moorage and dockage area.

In this type of administrative arrangement, the entire staff is involved in waste-handling. All employees are involved in policing the facility for trash and proper disposal of vessel maintenance wastes. This type of management activity and environmental awareness sets the tone for the other employees and boaters at the facility. The motivation for concern with the appearance of the facility does not stem from environmental activism, although this certainly may be a factor; it ultimately comes from a business-related decision to provide a high-quality service to the customer. In other words, it is just a good business practice.

Administrative Manager with Financial Decision-Making Authority. This administrative arrangement closely parallels the first example. The

major difference is the size of the recreational boating facility. Many large recreational boating facilities are too big to manage using the single owner/operator setup. In these cases, the administrative manager of the facility may have ownership interest in the business and, thus, has financial decision-making authority within the facility.

As with owner/operator involvement, this administrative structure leads to close proximity of the financial decision-maker to the day-to-day operations of the facility, including waste-handling. The "good business" incentive of the financial decision-maker is again prevalent. The correlation between providing a clean environment and quality service to the facility user compels the manager to provide effective waste-handling and disposal methods at the recreational boating facility.

Because of the size factor in these large recreational boating facilities, a staff to specifically handle waste disposal is necessary. One or two staff members may be assigned the responsibility for emptying the receptacles (in facilities using interim collection receptacles). The advantage of this arrangement is obvious: greater efficiency and clear lines of responsibility. However, the downside is that employee roles may become too compartmentalized. Other employees may ignore trash on the ground instead of picking it up and placing it in the trash receptacle; presumably with the thought that trash is "somebody else's problem." If the manager at these facilities changes the job descriptions so that all employees are mandated to participate in the proper disposal of trash, including policing the grounds for litter, the problem disappears.

Administrative Manager without Financial Authority. This arrangement is found at larger facilities. The increased demands of larger facilities create a need for the owner/operator to have a facility manager. Here, the administrative manager is responsible for the daily operations of the facility, while the owner still retains authority to make decisions, in particular, financial decisions.

In this administrative structure, the owner/operator is not close enough to the day-to-day operations to realize the benefits of a progressive waste-handling

strategy. In addition, the administrative manager of the boating facility does not have the incentive to improve the quality of the waste-handling; the manager is not concerned with how a progressive, or efficient, waste-handling strategy can positively impact the financial situation of the facility. Because waste-management issues are decided by upper management, it is more difficult to implement an efficient, environmentally sound waste-management strategy with this type of arrangement. Typically, the owner is not intimately familiar with the situation, including the waste-management issues, and the manager is concerned only with carrying out the requests of the owner.

At these type facilities, a dedicated staff of usually one or two employees is responsible for emptying the waste receptacles. While this is an efficient system with clear lines of responsibility, the danger, as mentioned above, lies in the perception among employees that trash and litter at the facility are somebody else's responsibility.

Dockmaster/Harbormaster/Manager Where the Facility Is Part of a Larger Complex. This type of administrative arrangement can be found at both public recreational boating facilities and at facilities connected with hotels or condominium complexes. The manager (dockmaster/harbormaster/manager) is responsible for the day-to-day operations of the facility, but is governed by the overall concerns and regulations of the complex.

Again, with this type of administrative structure the owner/operator of the complex has little familiarity with the daily operations of the facility. Managers find themselves in the position of lobbying for facility interests to the owners of the complex. As a result, it is often difficult to convince top management of the benefits of an efficient waste-handling strategy. In this situation, waste-handling is generally thought of as a necessary but disliked chore, as opposed to other facilities where a well-planned waste-management strategy is viewed as a public relations benefit and a cost savings vehicle for the facility.

Depending on the size of the complex, the manager can have varying degrees of involvement with the waste disposal. At some facilities, the manager's office

space is connected to the dock area. This location affords direct observation of the waste-handling of the facility and often leads to participation with disposal efforts. Support by port management is cited as critical

to the success of solid-waste management pilot projects (NOAA, 1988a, b; NJDEP, 1990a, b; Recht, 1988, 1990, 1991)

WASTE-STREAM CHARACTERIZATION

Wastes at recreational boating facilities lie in three categories. The categories, including representative examples of the types of wastes involved, are as follows.

- Galley Wastes
 - Plastics
 - Papers
 - Aluminum cans
 - Food scraps
 - Other miscellaneous galley items
- Vessel Maintenance Wastes
 - Used oil
 - Batteries
 - Paint
 - Antifreeze
 - Filters
 - Other miscellaneous operational items
- Recreational Wastes
 - Monofilament fishing line
 - Fish carcasses
 - Other miscellaneous recreational wastes

Most facilities are able to state, with reasonable certainty, their highest-volume waste items. Many of these items are recyclable materials. In most cases, galley wastes such as aluminum cans, paper, and plastics are cited as the highest-volume items. At facilities with a large number of transients and/or liveaboards, newspapers are the highest-volume item.

At most facilities, there is an awareness of the regulations surrounding the disposal of the vessel maintenance wastes, especially used oil. Facilities deal differently with the need for special care of these wastes; some provide separate receptacle facilities, others prohibit the disposal on their property.

Recreational wastes, such as monofilament fishing line and fish carcasses, make up a very small percentage of the volume of wastes at any facility. These wastes, however, make up a large proportion of environmental problems when not disposed of properly. Several recreational boating facilities single out these wastes as specific problem areas that need to be better addressed. Solutions to deal with these wastes have been implemented at individual facilities. Recycling of monofilament fishing line and grinding of fish carcasses are examples of facilities' efforts to avoid improper disposal.

Studies of waste-generation rates at recreational boating facilities have found that transient recreational boats produced between 0.7 and 1.4 lb of solid waste per day per person, assuming an average of four passengers per boat or two passengers per boat, respectively (Mudar, 1991). For purposes of calculating trash reception facility capacity, a second rule of thumb is 4 to 6 gal of reception capacity needed per person per vessel per day. A cubic-yard dumpster holds 216 gal of trash (Recht, 1988).

EQUIPMENT AND SERVICE ALTERNATIVES

Four types of equipment and service alternatives for waste-handling are typically found at facilities. These are as follows, based on accessibility to boaters.

- Dumpster only — Trash disposed of in dumpster; trash picked up on scheduled basis by municipal or commercial hauler
- Dumpster primarily, receptacles accessible — Trash disposed of primarily in dumpster; facility staff empties receptacle contents into dumpster; trash picked up on scheduled basis by municipal or commercial hauler
- Receptacles primarily, dumpster accessible — Trash disposed of primarily in receptacles; receptacles emptied by staff into dumpster; dumpster emptied on scheduled basis by municipal or commercial hauler.

The waste-handling process depends on the choice of equipment used (see Figure 2). Facilities with trash receptacles and a dumpster must use facility employees to collect the trash from the receptacles and dispose of

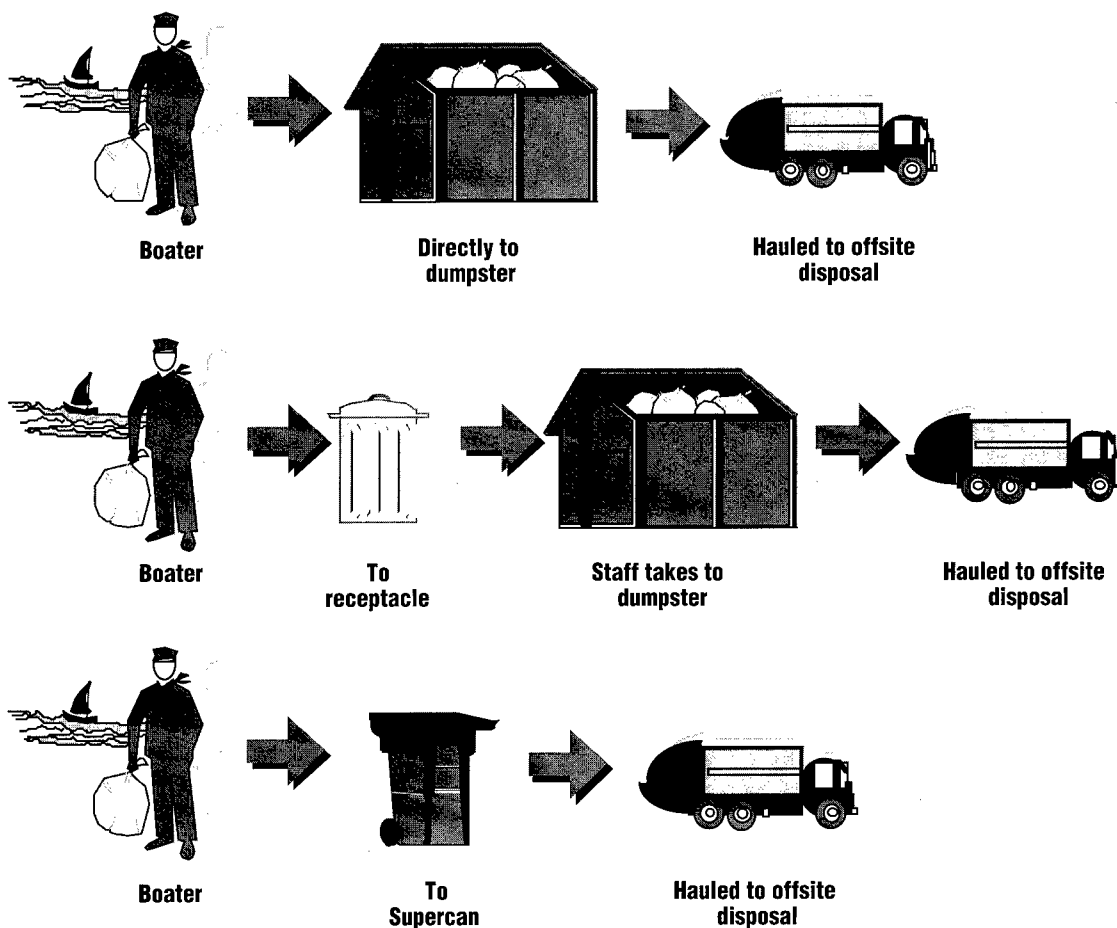
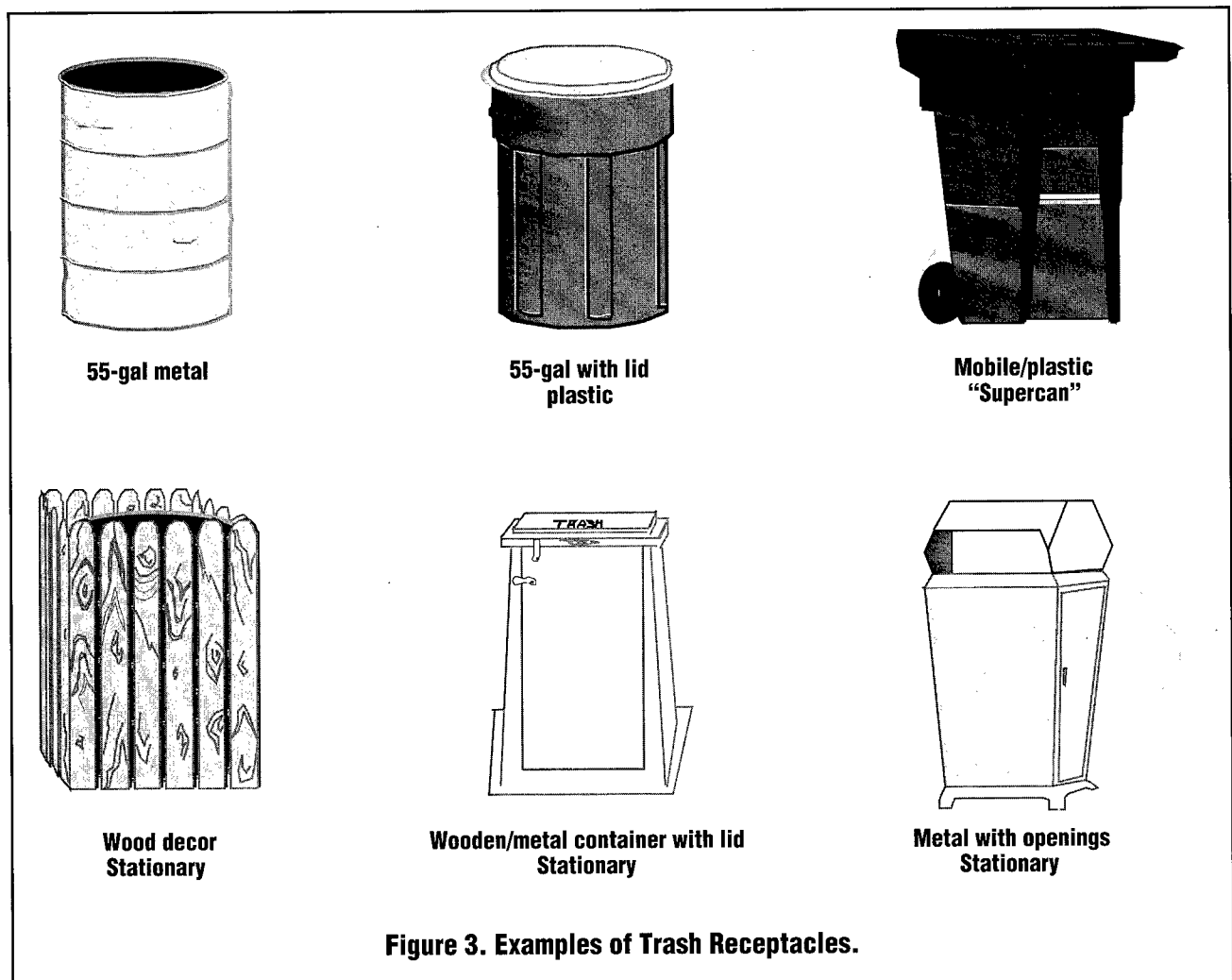


Figure 2. Waste-Handling Alternatives.



it in the dumpster. In contrast, facilities using only a dumpster eliminate the need for intermediate handling.

At many facilities, small trash receptacles are kept in the on-site store or behind counters, but for practical purposes the boater is required (and encouraged) to use the dumpster to dispose of trash. However, many times these dumpsters are kept in locations inaccessible to the boater (e.g., across streets, in enclosed locked shelters, etc.). In those cases, boaters are required to use the smaller receptacles to dispose of trash.

A variety of trash receptacles is found at facilities, ranging from open, metal 55-gal drums to smaller plastic receptacles completely enclosed within an immobile wooden structure. Plastic 55-gal drum

equivalent "supercans" are used, both mobile and stationary. Some receptacles have lids; others do not. Plastic liners are used in all types of trash receptacles. At some facilities, esthetic considerations are balanced with functional needs to provide a receptacle with an outside covering to match the wood or metal decor of the dock area.

Examples of the types of trash receptacles used include (see also Figure 3):

- 55-gal, metal
- 55-gal, plastic (with/without lid)
- 55 gal, plastic, chained, (with/without lid)
- Large plastic, mobile, with fastened lid; "supercan"
- Container within enclosed wood/metal structure, with and without a structure cover.

Some dumpsters are in central locations, in open settings; others are inside environmental shelters, or windscreens. There are three reasons for the windscreens: to provide a more esthetically appealing area, to fence the area off from use by unauthorized personnel, and to prevent trash from blowing away. At some facilities, more than one dumpster is provided for boater use. Facilities typically use dumpsters that range in size from 6 to 9 yd³. In addition, several facilities have compacting dumpsters on the premises.

The size of the trash receptacle used often dictates the schedule for trash collection. Some facilities use several small trash receptacles that are emptied several times a day. Other facilities use larger trash receptacles that are emptied less frequently, often once a day or, in one case, once a week. Similarly, those facilities using smaller dumpsters may require a more frequent

schedule of trash pickup than facilities using larger or compacting dumpsters.

As a means of encouraging boaters to return their trash to shore for disposal, some recreational boating facilities have offered special trash-disposal programs. For example, a project called Trashmaster was undertaken at a recreational boating facility in New Hampshire by the University of New Hampshire Sea Grant Extension Program (Doyle and Barnaby, 1989). Boaters paid a \$5 registration fee to participate in the project and then received a season's (4 months long) supply of trash bags, a Trashmaster pennant, and a lapel button. The boaters were asked to fill the trash bags while boating and to return the filled bags to the facility at the end of their trip. When they turned in their filled trash bag, they received a receipt that was entered into a monthly drawing for \$100 worth of supplies and services at the facility.

EQUIPMENT SPATIAL REQUIREMENTS AND SITING

The spatial and siting alternatives used at recreational boating facilities lie in five categories as follows.

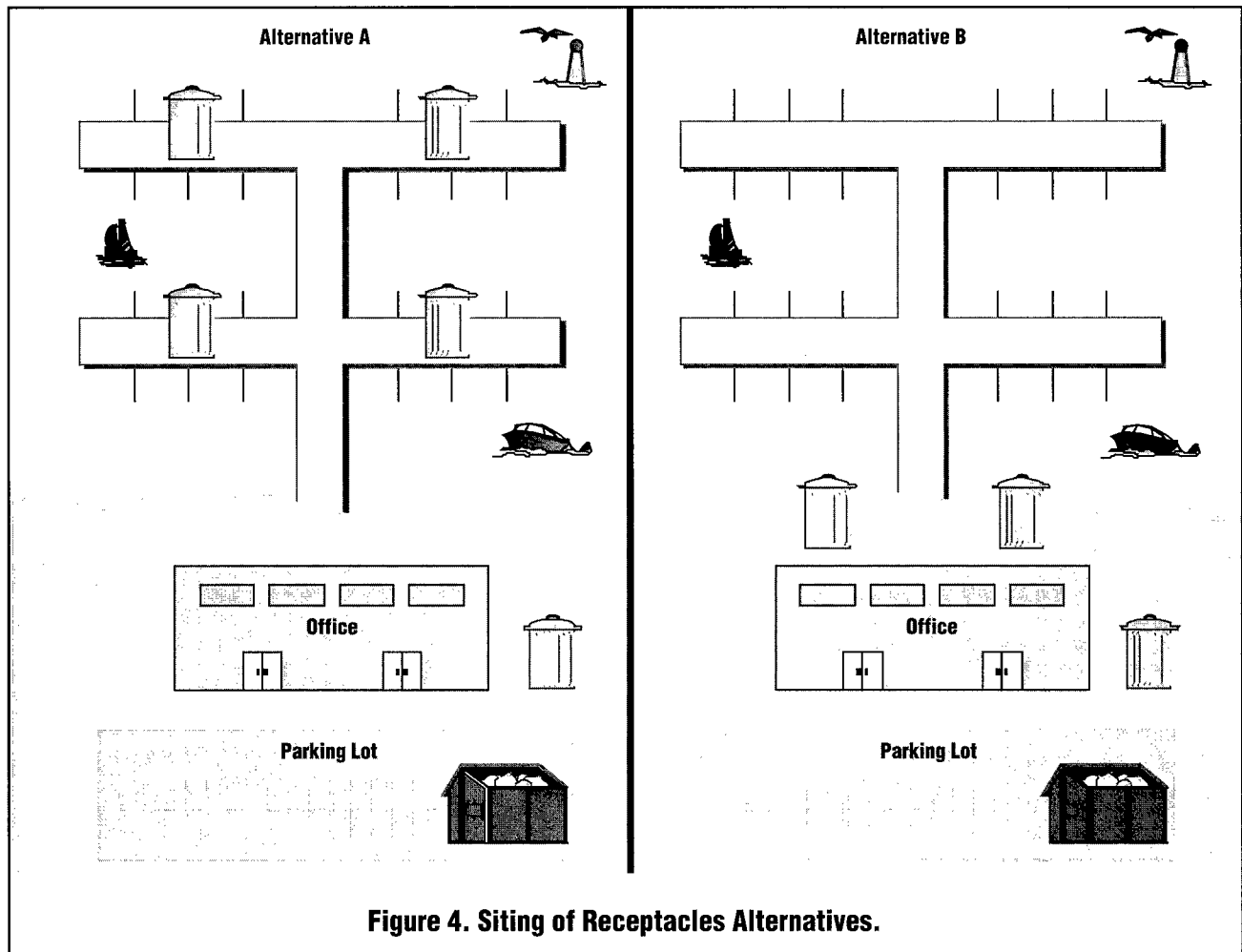
- Dumpster only — Requiring boaters to leave dock area and dispose of trash in central location, such as parking lot area
- Dumpster primarily — May be one or two alternative receptacles; boaters primarily leave dock area and dispose of trash in dumpster in central location
- Receptacles at the base of dock area — Receptacles placed in well-traveled, visible locations; boaters required to leave slip area
- Receptacles on the dock approximately every third slip — Boaters find receptacles within easy reach of every slip area
- Receptacles on the dock for every slip area — Boaters have receptacles at the base of every slip; very easy access.

Key factors affecting the location of waste-handling equipment at recreational boating facilities are facility size and manpower limitations. Facilities covering acres of land could not be adequately served by a single central location for trash disposal. On the other hand, a single waste-disposal location may be sufficient for a smaller facility with a very small work force.

An important siting consideration is the desire to avoid placing trash receptacles on the docks. The reason behind this was twofold: first, the placement of receptacles on the docks increases the chance for trash to end up in the water through either inadvertent mistakes by the boaters, or by the wind blowing loose trash or entire receptacles into the water. Some facility directors are adamant that trash receptacles not be located on a dock. Second, facility directors wish to make trash disposal a participative activity for the boater. If receptacles are placed within a few feet of each boat, disposal of trash becomes almost a passive

activity. The requirement that boaters leave the slip area and take their trash to a central (but not inconvenient) location makes the disposal of trash a much more cooperative activity and ultimately means that the flow of trash at the facility is easier to control for

the facility employees. Trash is less likely to end up in the water, signage and/or lighting is easier to place, and the labor needed to empty fewer receptacles is obviously less (see Figure 4).



RECYCLING

Recycling efforts at recreational boating facilities, in general, are not well developed. The types of products that are being recycled include

- Aluminum cans
- Glass
- Paper

- Cardboard
- Newspaper.

In addition, some products specifically used at boating facilities are being recycled. These products include

- Old batteries

- Waste oil
- Monofilament fishing line.

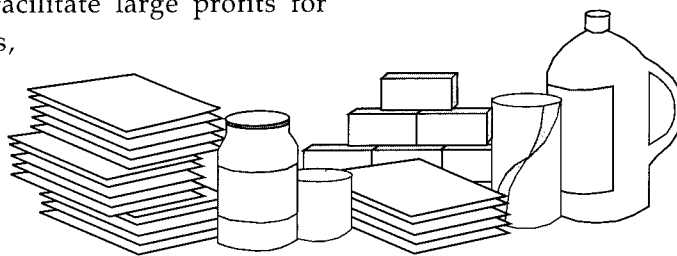
Facility Benefits of Recycling. For the facilities that initiate recycling efforts, the incentives for recycling include

- Environmental sensitivity
- Involvement in community organized or directed program for good public relations
- Satisfying requests of boaters for recycling
- Cost savings due to reduction in volume of trash disposed.

Environmental awareness seems to be the overwhelming benefit to the recycling efforts of the facilities. As time has elapsed, these facilities have noticed a cost savings. These savings are realized when the overall volume of trash is reduced through recycling. The reduced trash volume means that the dumpsters will require less frequent servicing by a commercial or municipal trash hauler, which, in turn, lowers the cost of waste disposal.

Facility directors are also reacting to the requests of the boaters for recycling programs. Several facility directors reported an interest in recycling owing to the popular demand of their boaters. This type of appeal is not prevalent, but may continue to grow. Recycling may become an area where facility directors see a public relations benefit to having a program in place.

At this point, municipal recycling programs are not developed enough to facilitate large profits for aluminum cans, glass, paper, and other recyclable materials. Facilities instituting recycling programs are content with reducing their disposal wastes and earning small amounts of money for their recycling efforts. While this money may not be substantial, it is considered a positive investment to the facility and, together with the other benefits, becomes a worthwhile program.



Most of the State/County/ Municipality recycling programs around the country, have concentrated on residential recycling — which has ready-made and easily targeted participants. There is a trend, toward mandatory commercial recycling programs. For example, in New Jersey recent legislation requires that many new commercial facilities be designed with recycling receptacles or programs in mind. As the programs mature, they will grow to encompass other audiences. Recreational boating facilities should be able to tie into these programs, as the programs grow stronger, and should be able to enhance their solid-waste management systems.

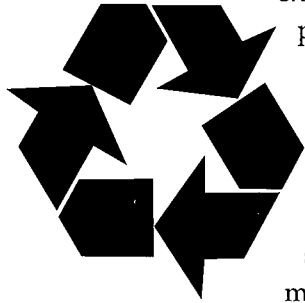
Project ROSE (Recycled Oil Saves Energy), a nonprofit conservation program sponsored by the University of Alabama, is an example of a well designed and implemented recycling program with potential ties to recreational boating facilities. It has been in existence since 1977. The program provides a combination of services to do-it-yourself (DIY) oil changers to safely dispose of used motor oil. Project ROSE provides more than 300 collection services to include curbside pickup, collection centers (service stations, garages, etc.), and 55-gal drum dropoff centers around the State to collect used oil. Newspaper, radio, and television advertisements were used to inform the public. In addition, the program operates two tollfree, in-State hotlines. Because of the convenience to DIYs and the effective advertising campaign, in 1 year Mobile's used-oil recycling rate went from 300,000 gal of used oil reclaimed to 750,000 gal (EPA, 1989).

Recreational boating facilities are ideal locations for the 55-gal drum dropoff centers.

It should also be mentioned that many municipal recycling programs currently do not

accept plastics — a prohibition of particular concern to those who view recycling as a method for gaining MARPOL Annex V compliance. The plastics recycling industry is not well-developed; plastic is more difficult to reprocess, or recycle, than such recyclable materials as newspapers and aluminum cans. Because of these

technological difficulties, there are limited markets available for collected plastics; and, it may not pay a facility to collect plastics for recycling. However, interest in plastics recycling is booming. Many industry groups, such



as beverage manufacturers, are experimenting with new packaging made from recycled plastic. Additionally, the legislation described above is driving the industry further. It will soon become mandatory in many States to recycle plastics.

Facility Challenges to Instituting a Recycling Program. The problems in developing a recycling program include

- For a program based on boater source separation of recyclable materials: The lack of space for separate recycling containers and the perception that it is inconvenient for boaters to separate trash, especially on board ship while out at sea
- For a program based on the collection of commingled recyclable materials (i.e., mixed recyclable materials brought to a recycling container by a boater): The need for the facility to separate the materials or to find a market that will accept commingled materials
- General impression that the volume of recyclable trash is too low to make recycling efforts worthwhile
- Lack of available manpower to oversee boater's recycling efforts and/or separate recyclable items
- Absence of municipal program to ensure adequate disposal of recyclable items.

These obstacles, while not prohibitive, are serious concerns for facilities.

FINANCING AND COST RECOVERY

Facilities are interested in finding the least expensive hauling contract that meets trash disposal needs. The basic waste-management costs and related fees for the facilities typically are as follows.

- Facilities are on monthly contracts with either commercial or municipal waste-haulers, or, in the case of a recreational boating facility connected with a larger hotel complex, with the owning corporation.
- Facilities do not separate out waste-management fees to their clients. All fees, including utilities, security, and cable television, are built into monthly or daily rates.

Also, some facilities impose a surcharge for additional services rendered. Several facilities charge an extra fee to boaters who are liveaboards, request

pumpout, or, in some facilities, request disposal of used oil.

Cost recovery may be an issue that will receive consideration as recycling programs become more widespread. Because the monthly contracts with commercial firms are based on the number of dumps per month, recreational boating facilities are basically paying for these services on a per-dump basis. This opens the possibility for facilities to save money by reducing the number of times a dumpster is emptied. Some facilities are already realizing a cost savings for waste disposal owing to a decreased volume of trash resulting from recycling programs. As these programs grow, facilities may be able to factor the cost savings and money earned from recycling into their waste-management program.

COORDINATION OF RECREATIONAL BOATING FACILITIES AND BOATER REQUIREMENTS

Generally, the coordination of waste-management requirements for boaters and facilities does not pose a problem. A common sense approach is used to balance the requirements of these two interests. The coordination factors include

- Costs
- Adequate containers for boater's trash disposal
- Ease of boater and hauler access to disposal receptacles
- Variations in seasonal demands
- Accommodating operational, recreational, and galley wastes
- Instructions to boaters about disposal methods
- Maintaining an esthetically pleasing environment
- Vermin/rodent control and other general health concerns.

A variety of methods is employed to adequately meet all of these requirements. While some facilities meet all the criteria by having one dumpster in a central location, others use many small receptacles in special protective coverings and more than one dumpster. In some cases, inefficient systems are used. Examples of these cases include too many receptacles which requires intensive use of labor for emptying; receptacles too close to the water, which requires additional labor to remove trash from the water; and, inconvenient location of dumpsters.

The presence of lights around trash receptacles or signs or maps to trash receptacles makes waste disposal easier for boaters and helps to prevent inappropriate trash disposal (e.g., used oil in the dumpster and bags of trash left on the dock).

HANDLING FACILITIES FOR VESSEL MAINTENANCE WASTES

Vessel maintenance wastes typically handled by recreational boating facilities include

- Used oil
- Batteries
- Paint.

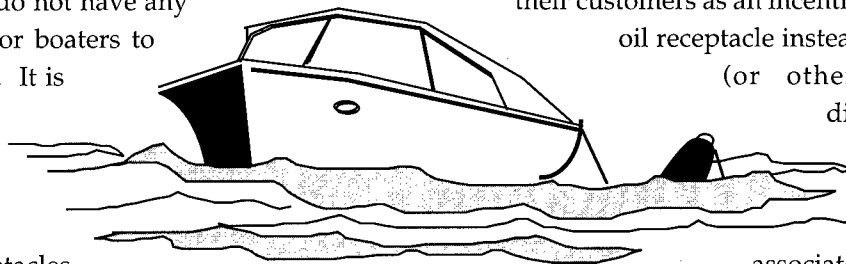
Used Oil Handling. Waste oil is certainly the most prevalent vessel maintenance waste substance handled. Some facilities have a process for disposing of waste oil. Others do not have any method available for boaters to dispose of used oil. It is the boater's responsibility to find an alternative disposal site.

Where no receptacles for used oil are provided, there is a potential for boaters to leave gallons of used oil on the dock. Many

boaters, especially transients on longer journeys, are severely inconvenienced by the lack of available used-oil disposal. This underscores the need for adequate disposal receptacles for used oil at recreational boating facilities.

Another issue facing facilities offering disposal of used oil is whether to pass on to the facility users the costs of having the used oil hauled away. Some charge a nominal fee to the facility users who wish to dispose of used oil, and some offer the service free of charge to their customers as an incentive to use the used-oil receptacle instead of the dumpster (or other inappropriate disposal method).

A related issue is the problems associated with having a "public" receptacle for used oil. A receptacle available for all to use, even with large signs,



sometimes is used in ways other than intended (e.g., used oil contaminated with other substances including water and bilge pumpout, which create a much more complicated disposal problem). To alleviate this problem, the used-oil receptacle at some facilities is locked. A facility employee must be present during disposal and is responsible for ensuring that only appropriate, uncontaminated waste oil is disposed. This method does ensure that only used oil is disposed. However, it also limits somewhat the boater's willingness to use the receptacle, as it has proven to be inconvenient.

Batteries and Paint Disposal. As with used oil, many facilities have appropriate methods for disposal of old batteries and empty paint cans. Some facilities stack old batteries in storage areas to be reclaimed by an outside organization. Some facilities provide signs and paint-mixing supplies to ensure that only empty paint containers end up in the dumpsters. Construction of "Paint racks" on which near-empty paint canisters can be placed upside down to drip dry the paint can, can help ensure that no paint ends up in the dumpsters.

MARPOL ANNEX V AWARENESS

Recreational boating facility directors often have the perception that MARPOL Annex V has very little to do with recreational boating facilities. The impression is that MARPOL Annex V applies to boaters alone because of the USCG requirement for a placard detailing the disposal restrictions for vessels 26 ft or more in length. At most, the directors see their facilities as a support to educational efforts on marine pollution. In addition,



for the facility directors, there seems to be little connection between adequate waste-handling facilities and regulations prohibiting the dumping of plastics and other trash in the ocean. The decision to have trash receptacles and a waste-management system is for common sense and "good business" reasons, not in response to regulations on port reception facilities for trash required by MARPOL Annex V.

OTHER ISSUES RELATED TO SOLID-WASTE MANAGEMENT

Handling Facilities for Sewage. A major issue facing recreational boating facilities in general, is the lack of sewage pumpout facilities (i.e., a device that cleans out the sewage holding tanks of boats). When speaking of solid-waste management issues, the subject of sewage-handling comes to the forefront at virtually every occasion. Lack of sewage pumpout facilities to service the boating population is a problem. The result is a marked decline in water quality within bodies of water where boaters are suspected of dumping sewage overboard.

The major issues surrounding the sewage-handling for boaters at facilities include

- Within boating communities (i.e., facilities within the same physical locations), there is an inadequate number of facilities with sewage pumpout capabilities for the boater.
- In some cases, facilities would like to provide sewage pumpout services to their clients. However, a maze of Federal, State, and local environmental regulations has made it difficult to comply, thereby prohibiting the facility from installing the pumpout.
- Facilities without pumpouts often pass requests for those services on to those facilities that do have the capability. This can create friction among facilities because those facilities with pumpouts feel

burdened by not only the chore (which can be messy) but by having to bear all the costs of the system as well.

- There is a great deal of confusion surrounding which boaters actually need to use shore-based, sewage-handling facilities and which have sewage systems on board that are USCG-approved. Many boaters with sewage macerator systems on board (that may not be approved) are encouraged by facilities to dump their sewage overboard.
- Because it is so inconvenient to find a sewage pumpout facility in many areas, the majority of all boaters (99%, according to many directors) dump their sewage out in the water.

Regulations in many areas require that new, or expanding, recreational boating facilities be equipped with sewage pumpout capabilities. This may be appropriate. However, there seem to be pitfalls to this system. According to many directors, oftentimes facilities have a sewage pumpout device on the grounds to meet the regulation, but it is out of service. This type

of occurrence is not uncommon, because a pumpout is an expensive system to install and operate, and, in addition, is an undesirable chore for the employees who must operate the device.

Handling Facilities for Fish Carcasses. Another issue is the disposal of dead fish carcasses. Some facilities have charter fishing boat populations as regular customers. These fishing boats generally have a large number of fish carcasses to dispose of upon completion of their journeys. The method of disposal currently being used at most facilities is to simply dump the carcasses overboard. This disposal method can severely deplete the oxygen content of a body of water that does not have good water flow. Since many recreational boating facilities are constructed on enclosed bodies of water, this is becoming a problem. Several facilities visited have tried solutions to the problem, including the use of a fish grinder that funnels the ground up portions of fish into more open-water areas, and the prohibition of any dumping of fish carcasses while in the dock area.

SUMMARY OF FINDINGS, OBSERVATIONS, AND CONCLUSIONS

Summarized below are the findings, observations, and conclusions about waste-handling facilities, practices, and impediments to compliance with MARPOL Annex V at recreational boating facilities.

They are organized into four groups — administrative structure, approach to solid-waste management, recycling, and MARPOL Annex V.

Administrative Structure

- **Management support** is critical to a successful waste-handling strategy. Decisions about waste-handling are made by upper management, not delegated to administrative personnel. Management must commit or buy in to the examination of the existing waste-handling strategy and the provision of adequate and convenient reception facilities for trash. This commitment is most likely to be made because of common sense or good business practice, rather than because of USCG regulations implementing MARPOL Annex V.
- **Good business practice** for recreational boating facilities mandates a sound environmental program, including a solid-waste management program.
- **Someone must be put in charge** of the solid-waste management program. A sense of involvement can be created through the use of an advisory committee or simply asking facility users and employees. Keeping both users and employees aware of the waste-handling strategy is important to its success.

Approaches to Solid-Waste Management

- A **variety of approaches** to providing waste-handling service is used at recreational boating facilities. Some of the approaches require more participation on the part of boaters than others.
- The equipment used and its siting affect the **level of boater participation** required.

Recycling

- Recycling offers the opportunity to examine the waste stream and waste-handling efforts and in the process **increases the adequacy and convenience** to the total waste-handling strategy.
- Many items in the waste stream of recreational boating facilities are **recyclable materials**.
- There is **room for growth of recycling efforts** at recreational boating facilities. There is a need for information about recycling programs at recreational boating facilities directed at facility owners and operators. This includes both the benefits of recycling and how to start a recycling program at recreational boating facilities.

MARPOL Annex V Awareness

- There is **limited knowledge** about the requirements of MARPOL Annex V for recreational boating facilities among the facility owners and operators. There is also limited understanding among facility owners and operators of the at-sea garbage disposal restrictions on recreational boaters and even more limited understanding of the MARPOL Annex V requirements for recreational boating facilities.
- There is a **need to continue basic marine debris and MARPOL Annex V awareness efforts**. Typically, these include articles and public service announcements in professional and popular journals, media coverage of beach cleanups, demonstration projects at recreational boating facilities, and direct mailings to facilities.
- A **two-tiered approach is needed to encourage owners and operators of recreational boating facilities to increase waste-handling efficiency and ensure proper waste-handling practices**. This includes first an awareness program on the problem and second information on how to get started on (1) an assessment of solid-waste management practices, (2) recycling, (3) handling vessel maintenance wastes, and (4) a boater/community marine debris/MARPOL Annex V awareness program.

Awareness

**Module 1: Marine Debris
and MARPOL Annex V**

- The problem
 - Entanglement
 - Ingestion
 - Human health and safety
 - Beach litter
- A step toward the solution – MARPOL Annex V
- Reasons to Comply

Module 3: Benefits of Recycling

- Reduction in amount of wastes to be disposed
- Possible earnings from recyclable materials
- Improved public relations
- Direct boater involvement in waste-management issues

**Module 5: Special-Handling Requirements
for Vessel Maintenance Wastes**

- Can be difficult to handle
 - Physical state
 - Hazardous to human health
 - Hazardous to the environment
- May be regulated under Federal, State, or local environmental legislation

**Module 7: Recreational Boating Facilities Role
in Promoting Solutions to Marine Debris**

- Opportunity for leadership role
 - Increase efficiency of solid-waste management system
 - Potentially save money
 - Improve communication with users
 - Gain positive publicity and public recognition for efforts

How to Get Started

**Module 2: Assessment of Solid Waste
Management Practices**

- Put someone in charge
- Define facility needs
- Assess the existing solid-waste management system for adequacy and convenience
- Options to change the solid-waste management system
- Inform employees and users of changes
- Evaluate new system and adjust as needed

**Module 4: How To Start a
Recycling Program**

- Obtain management commitment
- Put someone in charge
- Evaluate the recyclable materials generated
- Find a market for the recyclable materials
- Choose handling methods and operations
- Publicize the recycling program
- Start the program
- Keep the program going

**Module 6: How To Start a Program
To Recycle Vessel Maintenance Wastes**

- Put someone in charge
- Evaluate the recyclable materials generated
- Evaluate the recyclable materials for special handling needs
- Find a market for the recyclable materials
- Choose handling methods and operations
- Handle all wastes in compliance with Federal/State regulations
- Tie into the general recycling program

**Module 8: Boater/Community
Awareness Program**

- Tie into existing activities
- Facility initiated activities

**Figure 5. Strategy To Encourage Proper Waste-Handling Practices
at Recreational Boating Facilities.**

3.0 STRATEGY TO ENCOURAGE PROPER WASTE-HANDLING PRACTICES AT RECREATIONAL BOATING FACILITIES

This Section outlines a strategy to encourage proper waste-handling at recreational boating facilities. The strategy is based on the characterization of waste-handling at recreational boating facilities and the findings, observations, and conclusions discussed in Section 2.0.

The strategy, shown in Figure 5, is made up of eight modules organized around two themes — awareness and how to get started. These two themes are further organized around two types of waste (trash and vessel maintenance wastes), recycling, and facility involvement in promoting solutions to marine debris.

The strategy stems from the conclusion that no one approach will be effective or is appropriate for all recreational boating facilities since knowledge and awareness of the issues among facility owners and operators varies as does their knowledge about how to develop and implement waste-management procedures. Therefore, there is need for both awareness and instruction on how to develop and implement waste-management procedures, and the role that recreational boating facilities can play in promoting solutions to marine debris. Each of the eight modules is discussed below.

MODULE 1: MARINE DEBRIS AND MARPOL ANNEX V

This module is directed at the recreational boating facility owner or operator who has yet to make a commitment to proper waste-handling practices. Getting commitment from the top management of recreational boating facilities is a driving force in having adequate and convenient trash-reception facilities at recreational boating facilities. Since this commitment is needed to achieve the overall goal in solving the problem of marine debris, it then is a key part of the overall strategy. Much of what is presented below was discussed in the Introduction. However, given the importance of understanding the problem and the steps toward the solution, the information bears repeating.

The Problem. Boaters have traditionally dumped their trash overboard. It is convenient and inexpensive for the boater in the short run, but potentially hazardous to marine life and costly to vessel owners, recreational boating facilities, and coastal communities in the long run. Increasingly, plastic material has replaced other material such as paper, glass, and metal. The special qualities of plastics — light weight, durable, and strong — make plastic items ideal for use on recreational boats. However, plastic does not easily disintegrate

and disappear into the marine environment. Therein lies the problem.

Persistent plastics are a hazard for marine life. Some marine animals become entangled in plastic debris such as six-pack rings. Other marine animals mistake plastic items for food. In either case, they can die. Plastic debris also poses a threat to human health and safety as a navigational hazard or through entanglement of divers and propellers. When plastic debris washes up on shore as beach litter, it is costly to coastal communities through lost tourism dollars and expenditure of funds for cleanup efforts. A list of selected reading materials on the problem of marine debris and persistent plastics is included at the end of this document.

Trash is ugly. Good business practice suggests that trash and litter in and around a recreational boating facility, on land or in the water, be picked up and removed immediately. Also plastic and other debris that floats into a recreational boating facility is costly to the facility owner through the labor and effort required to pick up and remove the floating trash.

Since 1988, beach cleanups have been coordinated Nationally as part of COASTWEEKS, a 3-week period each fall that celebrates the beauty and value of the

Nation's coasts. In 1990, during the National beach cleanup, about 108,750 volunteers cleaned 3720.5 miles of beach and collected an estimated 2,645,283 lb of debris in about a 3-h period (Cent. for Mar. Conser., 1991).

A Step toward the Solution. On December 31, 1988, an international treaty went into effect worldwide to help to reduce the problem of persistent plastics in the marine environment. MARPOL Annex V is implemented in the United States by the Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987, Title II of Pub.L. 100-220. MARPOL Annex V prohibits disposal of plastics at-sea and restricts at-sea disposal of other vessel-generated trash. It also requires shore reception facilities for the plastics and other trash brought to shore for disposal.

The USCG is responsible for developing, implementing, and enforcing regulations on the pollution-prevention requirements of MARPOL Annex

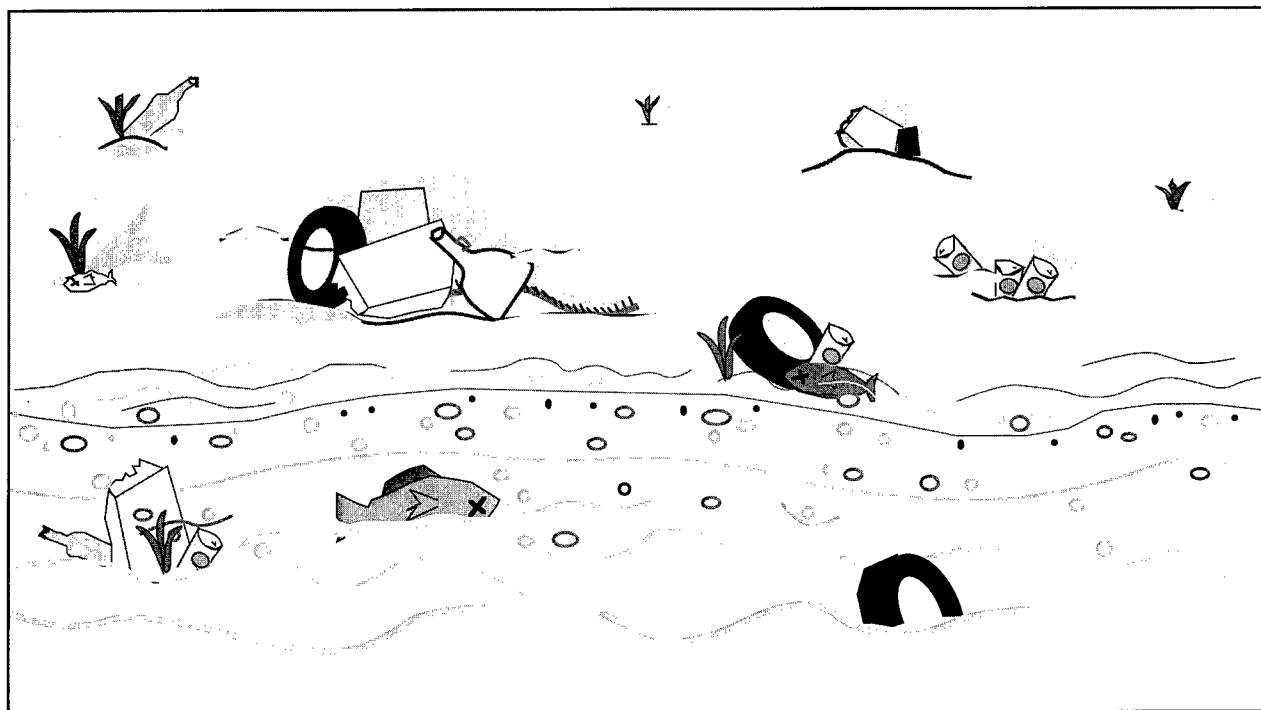
V. According to these regulations, recreational boating facilities, along with other ports and terminals, are required to have a trash reception facility that is capable of receiving trash from those vessels that do business with them (33 CFR 158). The approach used to provide "adequate" trash-reception facilities is, however, left to the port or terminal.

Reasons to Comply. Successful implementation of MARPOL Annex V will rely heavily on voluntary efforts because of competing priorities for enforcement efforts. Reasons to provide "adequate" reception facilities for trash include the following.

- It makes good business sense.
- It indicates an environmental awareness.

If those two reasons are not sufficient,

- It is required by regulation for recreational boating facilities.



MODULE 2: ASSESSMENT OF SOLID-WASTE MANAGEMENT PRACTICES

This module is directed at the recreational boating facility owner or operator who wants to assess the facility's solid-waste management system for adequacy and convenience. It focuses primarily on trash, although recycling and vessel maintenance wastes are touched upon briefly. Recycling and vessel maintenance wastes are discussed as separate modules later in the overall strategy to encourage proper waste-handling at recreational boating facilities. An assessment of solid-waste management practices is undertaken in a series of activities as outlined in Figure 6. Each of these activities is described briefly below.

Put Someone in Charge

This is a recurring theme in the provision of reception facilities for wastes at recreational boating facilities. Someone must be given the responsibility to determine adequacy of the facility's solid-waste management practices. There are three options for assigning the responsibility. First, the facility can hire a commercial hauler who will recommend options for type of receptacles, placement of receptacles within the facility, and a pick-up schedule. Alternatively, management can volunteer the facility as a pilot program for proper waste-handling at recreational boating facilities. Or, management can assign a facility employee to undertake the task.

Define Facility Needs

Facility Characteristics. Facility needs depend in part on the facility's characteristics in terms of users, types of wastes generated, facility layout, existing equipment, and labor availability.

Boater Requirements. Boaters need to be able to dispose of their wastes. The best way to identify specific boater needs is to ask — either in person out on the docks or through surveys. Facility newsletters or an insert in the account statement are other mechanisms to ask for information on boater needs. Formation of an advisory committee is another way to help to identify boater needs.

Facility Requirements. Facility requirements for waste-handling center on the health and safety of its

employees, vermin/rodent control, esthetics, and costs. Facility employees should also be asked for their thoughts on the waste-handling system when defining facility waste-handling needs.

Assess the Existing Solid-Waste Management System for Adequacy and Convenience

Waste-Stream Characterization. The types of wastes collected at the facility are significant since they have implications for needed capacity and for the types of collection systems needed — i.e., whether a separate system for collecting vessel maintenance wastes is needed and whether recycling is a possibility. Seasonal differences in the amount of trash brought to shore for disposal will affect the amount of capacity needed and will possibly affect trash pickup schedules. Also, the type and amount of wastes to be disposed on shore are affected by how individual boaters handle their own trash.

Equipment. The types and features of the equipment used to collect, store, and dispose of solid waste, along with the labor requirements of the existing waste-handling system, and the collection pickup schedule are part of the solid-waste management strategy. Specific problems in the collection areas such as overflowing cans, litter, bees, and birds need to be identified.

Equipment Siting. Siting considerations for trash receptacles include convenience and ease of access for facility users and access for haulers. High traffic areas are good locations for receptacles because of the easy access. Lighting and signs contribute to receptacle visibility.

Options to Change the Solid-Waste Management System

Capacity. Waste-handling capacity can be changed in a number of ways. These include adding receptacles, changing the size (either larger or smaller) of the receptacles, compacting wastes, increasing the frequency of trash pickup, and diverting recyclable materials to a recycling program.

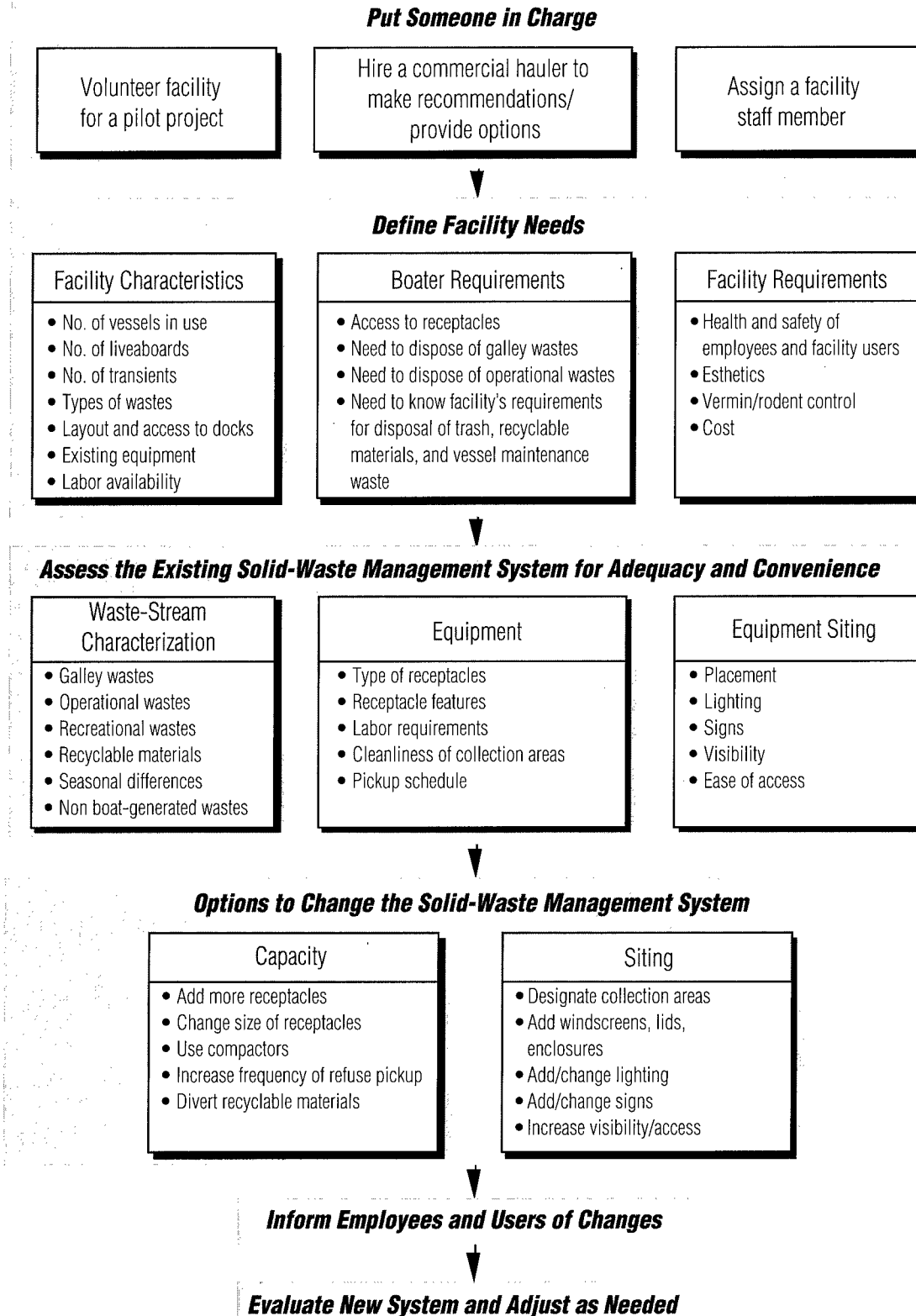


Figure 6. Assessment of Solid-Waste Management Practices.

Siting. Changes to the collection sites can also be made. These include establishment of centralized collection areas, addition of windscreens or shelters for receptacles, addition or changes to lighting, addition or changes to signs, and changes to the visibility of or access to receptacles.

Inform Employees and Users of Changes

Both employees and facility users need to be made aware of changes in the solid-waste management system. Employees need to be informed since they interact with facility users and need to be able to answer questions. Facility users can be informed of

changes through newsletters, bill inserts, notices within the facility, and by word of mouth.

Evaluate New System and Adjust as Needed

The solid-waste management system needs to be evaluated periodically to identify adjustments needed in response to changes in facility users, problems with operations and equipment, and costs. Baseline records for such things as costs, labor time, amount of trash, trash handling, and user compliance with the system can be established for comparison purposes before and after changes are made.

MODULE 3: BENEFITS OF RECYCLING

This module is directed at the recreational boating facility owner or operator who may not be aware of the benefits recycling can bring to the facility. Recycling can be an important component of a facility's solid-waste management program. A well-planned and executed recycling program can provide both tangible and intangible benefits for a facility. These benefits include a significant reduction in the amount of waste to be disposed, with a correlated reduction in waste disposal fees; possible earnings from recyclable materials; improved public relations with both the community at large and individual boaters; and direct boater involvement in the waste-management issues. These are discussed in more detail below.

Reduction in the Amount of Waste To Be Disposed. Most recreational boating facilities' waste-disposal costs are calculated on a per-dump basis. That is, the facility is charged each time a dumpster is emptied. Recycling can reduce the dump rate and thereby lower the service charges for waste disposal. Simply put, the more materials that can be identified as recyclable and sorted out of the waste stream, the less waste that has to be disposed. At one facility, it was estimated that as much as 62% of the waste stream consisted of the following recyclable materials: corrugated cardboard, plastic containers and bags, newspaper, glass, tin and steel cans, scrap metal and

wood (Coastal Resour. Cent., 1990). This did not include recoverable items such as used oil and batteries. If this facility recycled all of these materials, it could reduce its dumpster service rate by almost two-thirds.

Possible Earnings from Recyclable Materials. Waste-disposal cost savings also can be offset by any profits realized from selling recyclable materials to markets or end users. These costs can be used for other purposes. For example, recycling profits have been used for landscaping operations. It should be mentioned that prices for recyclable materials fluctuate widely, but profits can be made.

Improved Public Relations. Recycling just makes good business sense. A recycling program that is well thought out can significantly reduce litter at a facility, both in the water and on shore, making the facility more attractive to boaters. Also, at some facilities, individual boaters have expressed an interest in recycling. Finally, concern for the environment is rampant in the general community today. A facility with effective waste-management, including an effective recycling program, can be seen as part of a community's solution to pollution rather than a cause, thus generating good feelings toward the facility from both the community at large and individual boaters.

Direct Boater Involvement in Waste-Management Issues. The results of recycling pilot projects at

recreational boating facilities have suggested that, if recycling is made convenient and easy for boaters they will likely participate, and will have pride in what they are doing (NOAA 1988a; NJDEP, 1990b; Coastal Resour.

Cent., 1990). Generally, if a recycling program is successful, the boaters will be more likely to police themselves and less likely to inappropriately dispose of wastes, whether recyclable or nonrecyclable.

MODULE 4: HOW TO START A RECREATIONAL BOATING FACILITY RECYCLING PROGRAM

This module is directed at the recreational boating facility owner or operator who wants to integrate a recycling program into the facility's solid-waste management system. A recycling program must be well-planned and well-executed. Figure 7 shows the steps that should be followed to successfully design and implement a recycling program. Each step is discussed in more detail below.

Obtain Management Commitment

Studies have shown that, to be successful, a recycling program must also have complete support from top management, including the financial decision makers (NOAA, 1988b; Recht and Lasseigne, 1990). Management must understand not only the benefits of recycling but also how recycling can fit into a general solid-waste management program. Management must understand and be committed to the following.

- Without complete management support, the recycling program will falter and eventually fail.
- Time, staff, and financial support (at least initially) for the program must be established. Someone must be assigned the responsibility for the program.

Put Someone in Charge

Once management has decided to support a recycling program, someone must be chosen to run the program. This individual will be responsible for researching the available recycling options and for designing and implementing the program and, generally, the day-to-day operations of the program. That person will also identify and correct any problems with the program and work with State and local officials. Management can usually assign program responsibility to one of the following.

In-House Staff Member. This is a facility staff member whose job description has time built in specifically for recycling. In some cases, recycling and other waste-management issues may be that individual's entire job. This person is responsible for the program from start to finish, including working with boaters to ensure appropriate waste handling.

Outside Commercial Service. Alternatively, the facility can hire a commercial waste handler to run the program from start to finish. This can be more cost-effective and less labor-intensive for the recreational boating facility. An experienced commercial recycler can set up a system quickly, using its equipment and service arrangements. The facility buys an existing program, saving time and money that would be spent to develop a program from scratch. It is also possible that the facility may be able to expand its existing waste-disposal contract to include recycling services. With this option, the facility does not have to pay a staff member to handle recycling per se, but a staff member will still need to work with the boaters to ensure appropriate waste handling.

Tie into an Existing Municipal Program or Ask for Community Volunteers. Often, a recreational boating facility can tie into an existing municipal recycling program or find a committed volunteer to run the program. To comply with recycling and source-reduction legislation and regulations recently promulgated in some States, many local governments have already instituted recycling, or are in the process. A recreational boating facility often can tie into these municipal programs easily and cheaply, as the program will usually provide equipment and pickup at little or no cost. Alternatively, the facility can ask for a volunteer from the community, such as church groups or Boy/Girl Scouts. These groups are generally

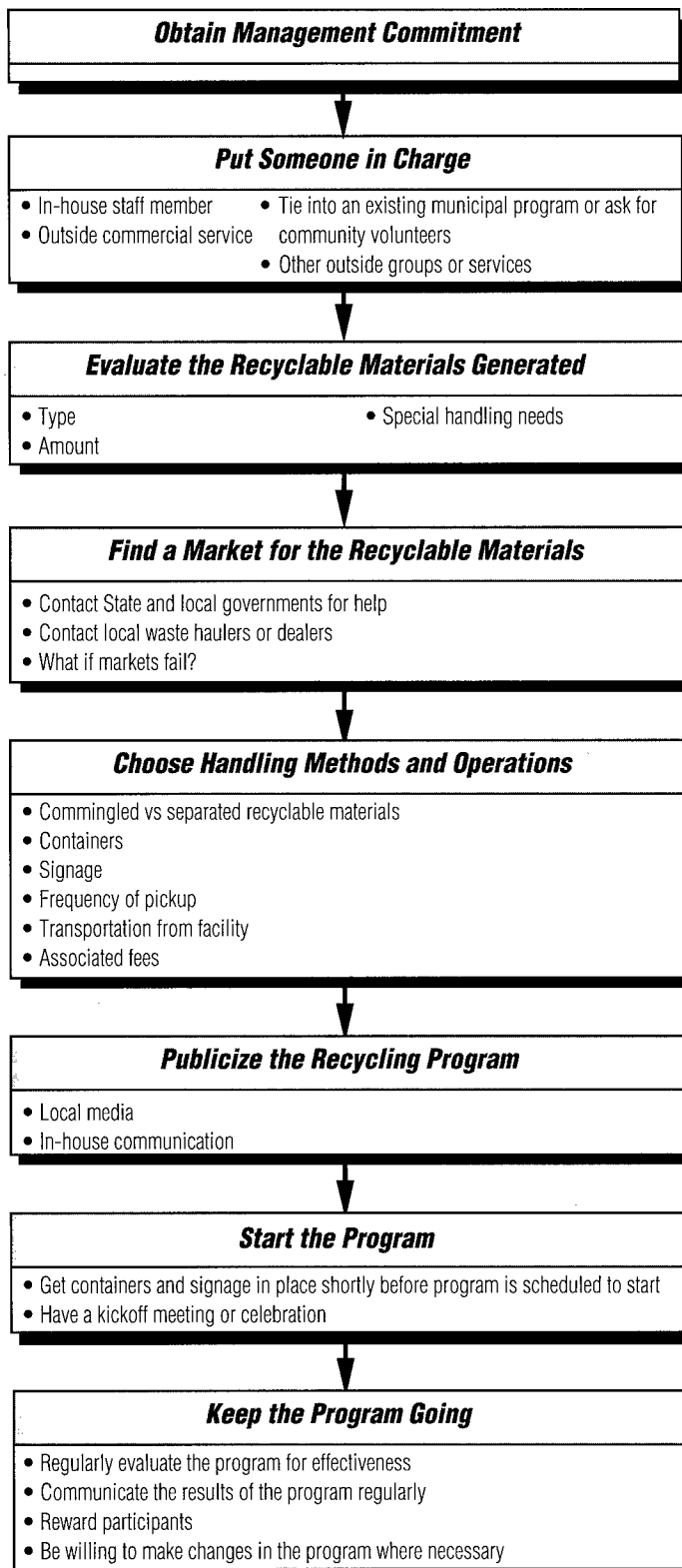


Figure 7. How To Start a Recreational Boating Facility Recycling Program.

willing to help and will often split any profits with a facility. Both of these options provide the facility with good community relations. The facility will still have to work with boaters to answer questions or help to solve problems. Also, the success of the program depends on people outside the control of management.

Other Outside Groups or Services. State government, universities, and corporations may sometimes be willing to set up and operate programs or issue grants for programs. Management can volunteer its facility for these programs. Again, the facility will still have to work with boaters to answer questions or help to solve problems. Again, the success of the program depends on people outside the control of management.

No matter who it is, the person who is responsible for the recycling program [hereafter referred to as the recycling coordinator (RC)], will go through the same steps to design and implement a recycling program suited to the individual facility.

Evaluate the Recyclable Materials Generated

The solid-waste stream at recreational boating facilities is similar to that generated in the home to include glass, newspaper, cardboard, aluminum cans, tin and steel (or bimetal) cans, and plastics. These materials are commonly recycled. To determine what recyclable materials are generated at a particular facility and thus what should be included in the recycling program, the RC must examine the waste stream for those materials. The evaluation should include the following.

Type. The waste stream should be evaluated for the types of recyclable materials generated. Every facility is different. The waste must be categorized into nonrecyclable materials, such as food wastes, and recyclable materials such as newspapers; aluminum cans; bimetal cans; plastics, to include beverage bottles and plastic bags; and others.

Amount. Once the recyclable materials have been identified, the RC must calculate the amount of recyclable materials generated. If a facility does not generate enough of a recyclable, it may not be profitable or possible to recycle that material. The RC must

include consideration of any seasonal variations in amount. For example, does the facility generate more waste during the busy summer boating season?

Special Handling Needs. The RC must determine if any of the recyclable materials, particularly from vessel maintenance operations such as used oil and batteries, have special-handling requirements.

Based on this evaluation, the RC must then choose which recyclable materials are appropriate for collection at the facility.

Find a Market for the Recyclable Materials

Collection is only one part of a successful recycling program. If the recyclable materials collected by a facility are not purchased or accepted by a buyer, or market, the recyclable materials are often considered trash and are disposed of as nonrecyclable trash — trash that the facility must pay to dispose of. The RC must find markets for *each* recyclable to be collected. To identify markets, the RC should do the following.

Contact State and Local Governments for Help. Often, State environmental agencies will have information regarding available recyclable markets. Usually, this information consists of a list of end users or midpoint buyers. Also local government offices or the local chamber of commerce may have this type of information.

Contact Local Waste Haulers or Dealers. The RC can also call local waste-collection services. These commercial haulers often buy recyclable materials themselves or can refer the RC to an appropriate end user.

What If Markets Fail? The RC must also make provisions for recyclable disposal if markets fail. Often, the recyclable materials can be included in the general solid-waste management program. The RC can also search for other markets. Given the fluctuations in the value of recyclable materials, particularly newspaper, market stability must be considered.

Choose Handling Methods and Operations

Once a market has been found, the RC can then turn to the nuts and bolts of the program: how the recyclable

materials will be collected and taken off site. This includes equipment, collection method, service frequency, and financing. The RC should consider the following.

Commingled vs Separated Recyclable Materials. Will the program accept commingled recyclable materials, or will it require the boaters to separate the recyclable materials before depositing in an appropriate container? This decision affects everything else about the program.

Containers. The RC must determine the size, number, engineering considerations (e.g., lids, plastic liners, materials of construction, etc.), and spatial requirements of the collection equipment to be used. Appropriate equipment selection and siting are critical for program success. Equipment does not have to be expensive or complicated—it has to work. For example, an open-topped plastic, 55-gal drum could be a very functional collection device for both trash and recyclable materials. But, if the recyclable drum looks like the standard trash receptacle, boaters may not distinguish between the two—they could contaminate the recyclable materials with trash. Paint the recyclable drum a bright color—different from the trash receptacle, however—and the boater will be able to tell them apart.

Signage. The RC must provide appropriate signage. The program must be clearly and simply explained to boaters to encourage participation and to ensure that the recyclable materials are not contaminated. The containers must be marked. Posters and/or signs must be placed around the facility both to show where to discard recyclable materials and to encourage program participation.

Frequency of Pickup. The containers must be emptied on a regular basis. If containers overflow, boaters will view the area as messy and associate it with trash. Recyclable materials will become contaminated and will lose market value.

Transportation from Facility. The RC must get the recyclable materials removed off site. Often, the buyer or end user will pick up recyclable materials. The facility may be able to make arrangements with its trash-collection service to haul the recyclable materials off site, for no charge or for a share in any profits. The

facility also can arrange to transport the recyclable materials themselves.

Associated Fees. The RC must examine the costs for the program. How much will the containers, signage, and transportation cost? Can the RC negotiate a reduced waste-disposal fee for the facility? Will the program reduce the facility's waste-disposal fees?

Publicize the Recycling Program

Once the equipment and service arrangements for the program have been made, the RC must inform the boaters about the new program. The public awareness campaign should begin shortly before the start of the program. In addition to the signage discussed above, the program must provide a public awareness campaign to explain how the program works, where boaters can go if they have questions, and the benefits of recycling. If the boaters do not know that the program exists or do not know how the program works, the program will fail.

Local Media. The facility can place advertisements or public service announcements in local newspapers and/or local radio stations. Often, local media will provide an announcement of this type at no cost. The RC must provide simple and direct copy that explains the program in detail. A side benefit from this is improved public relations in the community—boaters are not the only ones who will see the announcement.

In-House Communication. The facility can provide in-house communication, such as newsletters, posters, and flyers. Again, the copy should be simple and direct, with appropriate graphics and diagrams.

Start the Program

At this point, the RC has identified which recyclable materials will be collected, has found markets for those recyclable materials, has chosen the equipment and operation procedures, and has advertised the program. The program is ready to go. To ensure success, the RC must do the following.

Get the Containers and Signage in Place Shortly before the Program Is Scheduled To Start. The containers should not be put into place too long before the public awareness campaign/start of the program. If boaters do not understand how the

containers are to be used, they will get into the habit of using the containers incorrectly. Conversely, if the containers are put into place after the start of the program, boaters will not immediately have a place to put recyclable materials and will feel that the program is neither thought out or well-designed.

Have a Kickoff Meeting or Celebration. Have a celebration or meeting at the start of the program. All participants should be invited to make sure that everyone has an opportunity to ask questions and to fully understand the program from start to finish.

Keep the Program Going

It is not enough to start a program. The progress of the program must be monitored and the boaters must be kept interested and participating after the initial enthusiasm has faded. To make the program a continuing success, the RC must be sure to do the following.

Regularly Evaluate the Program for Effectiveness. Occasionally review the results of the collection program. Have the amount of recyclable materials collected increased? Are boaters actively

participating? Have boaters complained about any of the procedures? The RC must measure the success of the program.

Communicate the Results of the Program Regularly. Keep the boaters informed about the program, via newsletter or other means. Let them know how much recyclable material has been collected and where there is room for improvement. Provide a forum for any questions or complaints.

Reward Participants. Keep participating boaters interested in the program. Offer posters, stickers, and other handouts — these make people feel good and are another promotional method. Reward exceptional participants with stickers, “gold stars,” or performance certificates. If boaters feel that they are part of pollution prevention, they will participate more eagerly.

Be Willing To Make Changes in the Program Where Necessary. No recycling program is set in stone. Collection methods can prove ineffective, markets for recyclable materials can fail, money for programs can dry up. Be prepared to make changes in the program based on these reasons and/or feedback from boaters.

MODULE 5: SPECIAL-HANDLING REQUIREMENTS FOR VESSEL MAINTENANCE WASTES

This module is directed at the recreational boating facility owner or operator who may not be aware that vessel maintenance wastes may have special-handling requirements. These wastes can be difficult to handle because of their physical state (liquids or bulky materials) or because they may be hazardous to human health or the environment. Vessel maintenance wastes include such materials as used motor oil, paint and paint solvents, and used batteries. Unlike most wastes in a facility's solid-waste stream, these items are liquids or are bulky and heavy solids. These wastes can also be ignitable, corrosive, toxic, and/or incompatible. They must be collected in separate containers that are appropriate to their physical state and hazard category.

Vessel maintenance wastes may also lie in waste categories that are specifically regulated under Federal, State, or local environmental legislation, including the

Resource Conservation and Recovery Act (RCRA). These regulations have specific handling procedures and operations for hazardous wastes and materials. These regulations dictate the way in which recreational boating facilities handle these wastes, and will require significant paperwork.

For example, used motor oil is not currently regulated as a hazardous waste under the RCRA. However, some states regulate used oil as a hazardous waste.

To avoid special waste-management practices, recreational boating facilities may prohibit these wastes at their facility. For example, some facilities do not allow boaters to paint their vessels at the facility, thereby eliminating waste paint or waste-paint solvent handling requirements. Also, some facilities do not provide for used oil drop off or recycling. If management does allow such wastes at their facility,

the wastes must be properly disposed of and, if appropriate, recycled.

Facility directors must work with Federal, State, and local agencies to find out which regulations may apply to their facilities and to determine which, if any, collection and disposal methods will be employed. The facility may also consider recycling these vessel maintenance wastes as an alternative to disposal. There

are lively markets for used oil and batteries. Steps for establishing a recycling program are discussed in the next module. If facility management does not choose to recycle these materials, it is suggested that management either ban these materials from the facility or work with their existing waste-management contractor to safely dispose of these materials.

MODULE 6: HOW TO START A PROGRAM TO RECYCLE VESSEL MAINTENANCE WASTES

This module is directed at the recreational boating facility owner or operator who wishes to explore the possibility of recycling vessel maintenance wastes. The steps are very similar to those provided in Module 4: How To Start a Recreational Boating Facility Recycling Program (see Figures 7 and 8). As for a general recycling program, management must be committed to recycling vessel maintenance wastes, and someone must be chosen to run the program. This person (organization) can be

- An in-house staff member
- An outside commercial service
- An existing municipal program or community volunteers
- Other outside groups or services.

Again, as in the general recycling program, the responsible individual or recycling coordinator (RC) will go through the same steps to design and implement a recycling program suited to the individual facility.

Evaluate the Recyclable Materials Generated

The solid-waste stream at recreational boating facilities is similar to that generated in the home but also includes vessel maintenance wastes. To determine what recyclable materials are generated at a particular facility and, thus, what should be included in the recycling program, the RC must examine the waste stream for recyclable materials. The evaluation should include the following.

Type. The waste stream should be evaluated for the types of recyclable materials generated. Every facility is different. The waste must be categorized into nonrecyclable materials, such as food wastes; standard recyclable materials such as newspapers, aluminum cans, bimetal cans, plastics; and recyclable vessel maintenance wastes.

Amount. Once the recyclable materials have been identified, the RC must calculate the amount of recyclable materials generated. If a facility does not generate enough of a recyclable, it may not be profitable or possible to recycle that material. The RC must include consideration of any seasonal variations in amount.

Evaluate the Recyclable Materials for Special Handling Needs

Standard recyclable materials such as newspaper, aluminum cans, and plastic bottles are nonhazardous solids. Recyclable vessel maintenance wastes need to be handled carefully, depending on the physical and hazardous characteristics of the recyclable materials. These characteristics drive the choice of handling methods and operations. Characteristics to consider include the following.

Physical State. Liquid recyclable materials (used motor oil, paints, and paint solvents) are more difficult to handle than solids. The potential for spills and leaks exists. The RC needs to determine how these wastes will be collected. For example, will the boaters bring sealed small plastic containers to a larger containment

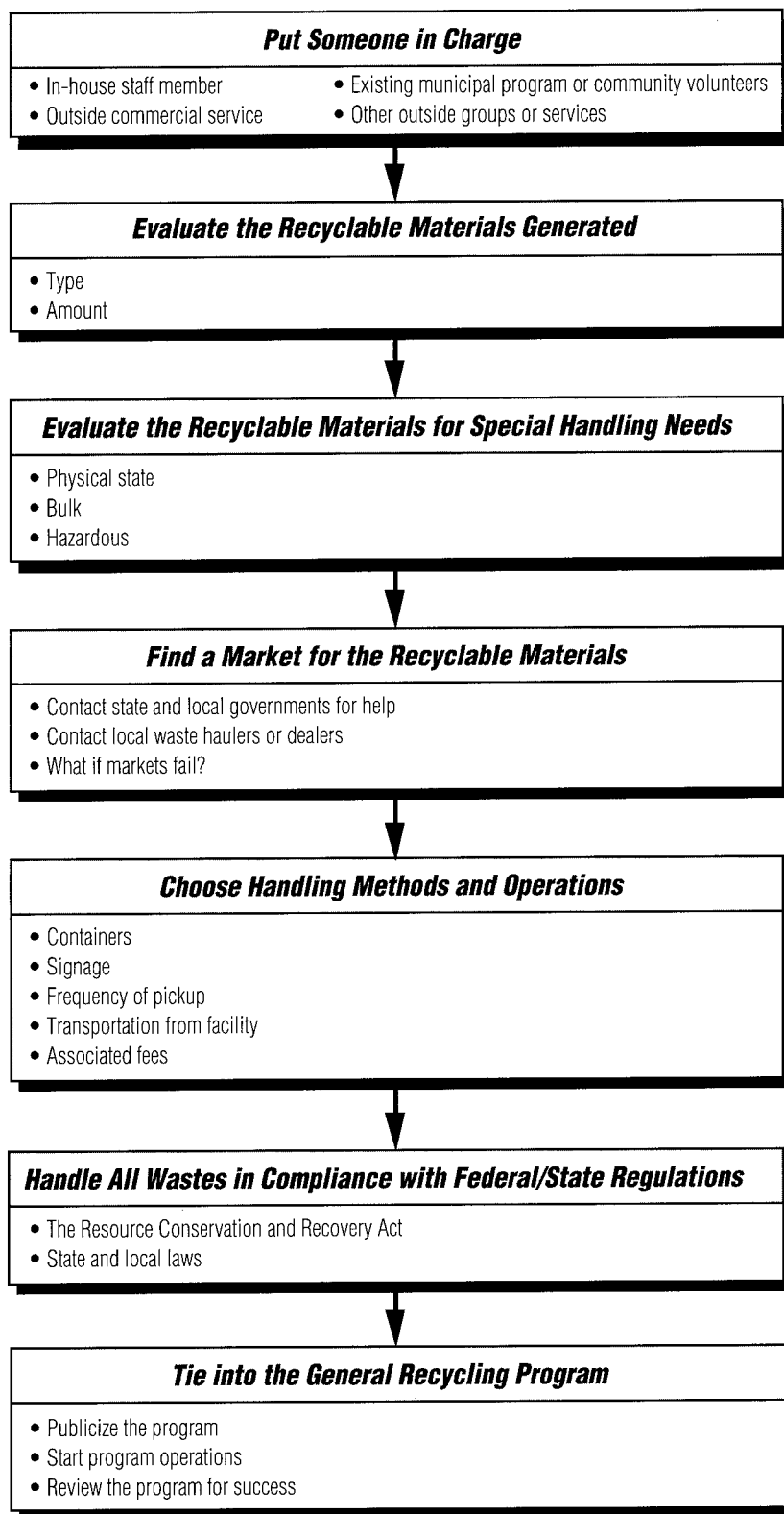


Figure 8. How To Start A Program To Recycle Vessel Maintenance Wastes.

area? Will the facility collect containers from the dock area and take them to a central collection point?

Bulk. Used batteries are bulky and inconvenient to collect in the limited space available at many facilities. An appropriate area (paved, preferably with a containment dike placed around the area) must be set aside for batteries. Paint cans and containers of used oil must also have a special designated space.

Hazardous. Recyclable vessel maintenance wastes that are corrosive, ignitable, reactive, and/or incompatible must be stored in separate, distinct areas appropriate for the physical state of the recyclable.

Find a Market for the Recyclable Materials

Collection is only one part of a successful recycling program. If the recyclable materials collected by a facility are not purchased or accepted by a buyer or market, the recyclable materials are often considered nonrecyclable wastes. These nonrecyclable wastes can be designated as hazardous wastes that have very high disposal costs. The RC must find markets for *each* recyclable to be collected. To identify markets, the RC should do the following.

Contact State and Local Governments for Help. Often, State environmental agencies will have information regarding recyclable markets available. Usually, this information consists of a list of end users or midpoint buyers. Also, local government offices or the local chamber of commerce may have this type of information.

Contact Local Waste Haulers or Dealers. The RC can also call local waste-collection services. These commercial haulers often buy recyclable materials themselves, or can refer the RC to an appropriate end user.

What If Markets Fail? The RC must also make provisions for recyclable disposal if markets fail. Often, the recyclable materials can be included in the general solid-waste management program. The RC can also search for other markets. Given the fluctuations in the value of recyclable materials, market stability must be considered.

Choose Handling Methods and Operations

Once a market has been found, the RC can then turn to the basics of the program: how the recyclable materials will be collected and taken off site. This includes equipment, collection method, service frequency, and financing. The RC should consider the following.

Containers. As in general recycling, the RC must determine the size, number, engineering considerations (e.g., lids, materials of construction, etc.), and spatial requirements of the collection equipment to be used. Appropriate equipment selection and siting is critical for program success. For example, to prevent contamination, at one facility boaters could place used motor oil in the recycling container only in the presence of a facility staff member. The staff member had to unlock the recycling container to allow the boater access. This proved to be inconvenient to the boaters, and the program has been deemed less than successful.

Signage. The RC must provide appropriate signage. The program must be clearly and simply explained to boaters to encourage participation and to ensure that the recyclable materials are not contaminated. Any potential hazards to human health from the recyclable materials must be explained. The containers must be marked. Posters and/or signs must be placed around the facility both to show where to discard recyclable materials and to encourage program participation.

Frequency of Pickup. The containers must be emptied on a regular basis. If containers overflow or leak, boaters will view the area as messy and associate it with trash. Recyclable materials will become contaminated and will lose market value.

Transportation from Facility. The RC must get the recyclable materials removed off site. Often, the buyer or end user will pick up recyclable materials. The facility may be able to make arrangements with its trash collection service to haul the recyclable materials off site, for no charge or for a share in any profits. The facility can arrange to transport the recyclable materials themselves.

Associated Fees. The RC must examine the costs for the program. How much will the containers, signage, and transportation cost? Can the RC negotiate a reduced waste-disposal fee for the facility? Will the program reduce the facility's waste-disposal fees?

Handle All Wastes in Compliance with Federal/State Regulations

The Federal and most State governments have established regulations for handling, disposing of, and/or recycling both solid and hazardous wastes. Hazardous-waste management in particular is monitored closely by regulators. Any recycling program that handles hazardous materials must consider the following, at a minimum.

The Resource Conservation and Recovery Act (RCRA). This program operates at both the Federal and State levels. The program sets the standard for waste-management practices, with a particular emphasis on hazardous wastes.

State and Local Laws. These laws include litter control, recycling, or solid-waste management laws, if applicable. The RC should contact the appropriate State and local officials to inquire as to the status of the RC's program.

Tie into the General Recycling Program

At this point, the RC should consider tying the vessel maintenance waste recycling program into an existing general recycling program at the facility. It makes sense to combine vessel maintenance waste recycling into the general recycling program. Resources can be maximized and shared to

- Publicize the program
- Start program operations
- Review the program for success.

MODULE 7: RECREATIONAL BOATING FACILITIES ROLE IN PROMOTING SOLUTIONS TO MARINE DEBRIS

There is heightened public awareness of the problems of marine pollution through highly publicized events such as medical wastes closing beaches and local and National beach cleanup efforts. Recreational boating facilities have an opportunity to take a leadership role in promoting solutions to marine debris. They come in contact with a large segment of the recreational boating and fishing community and are, therefore, a means of getting information to boaters.

The benefits of a recreational boating facility taking a leadership role in promoting the solutions to marine debris include increasing the efficiency of the facility's solid-waste management system; potentially saving money; improving communications with users; and gaining positive publicity and public recognition for the facility's efforts.

MODULE 8: BOATER/COMMUNITY AWARENESS PROGRAM

There are two ways for a recreational boating facility to become involved in a boater and community marine debris awareness program: either tie into activities sponsored by other groups or initiate activities themselves.

Tie into Existing Activities. The annual National beach cleanup is an obvious activity with which recreational boating facilities could get involved. The cleanup is held during COASTWEEKS, usually in late September. State coordinators generally come from the Sea Grant College Program, the state Department of Environmental Management, the state Department of Wildlife, Fisheries, and Parks, or the Center for Marine Conservation (headquartered in Washington, DC).

Facility Initiated Activities. The following are some boater/community marine debris awareness activities that have been initiated at recreational boating facilities. The time requirements of these activities range from minimal to considerable, but each is a step in increasing boater and community awareness about marine debris and the requirements of MARPOL Annex V.

- Establishment of an advisory panel to develop and implement environmental education
- Display of notices about MARPOL Annex V requirements for boaters at centralized locations such as the restrooms, laundry room, public telephones, ice freezers, and fuel pumps
- Display of posters about marine debris at centralized locations
- Displays including photographs of entangled animals, propellers entangled in monofilament

fishing line, and beaches and waterways littered with trash

- Reprint or original articles on marine debris, MARPOL Annex V, waste-handling, and recycling in facility newsletter
- Inserts such as brochures on marine debris and MARPOL Annex V or waste-handling at the facility in account statements sent to facility users
- Display of brochures, stickers, and factsheets in the ship's store or other centralized location in the facility
- Use of a boater's pledge statement to be part of the marine debris solution
- Display of signs about proper waste disposal at receptacles and other centralized locations
- Show video or slide shows on the marine debris issue at regularly scheduled or special meeting of facility users
- Cooperation with Boy/Girl Scouts or other local organizations in waterfront cleanup activities and environmental awareness programs
- Stock or distribution of the USCG required placard in the ship's store for boats of 26 ft or more
- Display or provision of a sample waste-management form for vessels of 40 ft or more.

Marine debris educational materials are available at minimal or no charge from the NOAA Marine Debris Information Office, operated under contract by the Center for Marine Conservation, 1725 DeSales Street, NW, Washington, DC 20036; (202) 429-5609.



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